810 Introduction

810.01 General

A detailed cost estimate shall be prepared in order to obligate funds for the construction activity and to determine a fair price for the work and a basis for evaluating contractor's bids. Estimates are comprised of various bid items arranged in a logical order with a variety of payment options (See Division 750 for special considerations). A complete estimate lists all work to be done by the Contractor, showing quantity, unit of measure, unit cost and total cost for each item. Cost estimates are prepared using one of two basic approaches or a combination thereof. Each method has its advantages and limitations. Bid-based estimating is usually easier and quicker. Items without an adequate historical base must be estimated using the cost-based method.

1. Bid-based estimating utilizes historical bid prices. Bid-based estimating procedures are typically based on the concept of comparable work, that is, choosing a price by finding similar projects in the same locality with a similar quantity of the item involved. WSDOT maintains a historical bid data broken down by bid item, region, contract number, plan quantity, and the bid prices of the three low bidders.

2. Cost-based (scratch) estimating utilizes labor, equipment, and material cost information. Cost-based estimating directly incorporates cost and productivity factors relevant to the project into the estimation process.

Other than the estimate range included in the advertisement for bids, estimate information is to be kept confidential until bids have been received and opened.

820 Content

820.01 General

The contract estimate shall include the following:

1. A list of all bid items in correct order, showing contract item number, standard bid item number if applicable, unit of measurement, estimated unit price, estimated quantity, and total estimated cost for each. The total amount of all items is designated the "Contract Total."

2. Washington State sales tax (if applicable).

3. Work by others at WSDOT expense.

4. Construction engineering costs.

5. Contingency costs.

6. Work by WSDOT at WSDOT expense (state force work – see Division 750.25).

7. The value of materials furnished by the WSDOT (see Division 750.25).

8. Calculated amortization of materials sites and stockpile sites, even though the costs may not be known at the time the estimate is prepared.

9. Estimated amount for royalty payments.

830 Preparation

830.01 General

The region enters contract estimates into the Estimate Bid Analysis System (Ebase). A job number unique to each project identifies the

estimate for each contract. The same job number used to identify the contract provisions should be used to identify the estimate.

The following elements should be considered in preparation of the estimate, as appropriate:

1. Previous unit bid prices. Upcoming projects should be matched to the most recent projects for which bids have been received, according to type, size, and location of project, to develop base prices for estimating the value of the work.

2. An adjustment to the base prices based upon the ages, quantities and individual conditions of the similar projects.

3. Inflation rates may be considered to update past information, but past inflation rates should not be projected into the future unless based on circumstances that can be reasonably expected to occur, such as anticipated changes in the cost of labor, equipment, and materials.

4. Surveys of local market prices for labor, equipment, and materials for unusual items of work, or those with fluctuating prices.

830.02 Mobilization

Mobilization is a contract pay item used to cover a Contractor's preconstruction expenses and the costs of preparatory work and operations. Since there is no clear list as to what this work effort is and each Contractor has the ability to adjust their bid as needed to cover these expenses, there are no true rules as what percentage should be used per Contract. The following table is a suggested guide:

Less than $100,000,	Use 7 to 10 %
$100,000 to $500,000,	Use 6 to 10 %
$500,000 to $1,000,000,	Use 6 to 8 %
Over $1,000,000,	Use 4 to 8 %

Consideration should also be given to the location of a project, the complexity of a project, the need for specialized equipment, the type of work and the working season if extend over more than one construction season, when determining mobilization. Rural projects vs. urban, projects with multiply work sites, projects with a lot of preparatory removal items, projects with large quantities of excavation or projects extending over two seasons where the Contractor would be expected to shut down operations and move out would probably require a higher mobilization percentage.

For complete instructions on developing estimates in the EBASE system, see the EBASE Users Guide. The EBASE Users Guide may be accessed directly from EBASE by selecting HELP, or through the Internet at the following address:
http://www.wsdot.wa.gov/eesc/design/projectdev/AdReady/EBASE.htm

830.03 Engineering and Contingencies

Contingency percentages are set up to handle unforeseen changes in a project. Changes such as additional work, quantity over-runs, and additional items are some of the contingencies that maybe expected in a project. Currently for all WSDOT contracts, contingencies are limited to 4% of the total contract amount. For local agency projects administered by WSDOT off the State Highway system no contingencies percentage will be set up.

Engineering percentages is the amount of monies set up in each contract for the departments operating costs to administer that project. These percentages will vary by type of work and total dollar amount of the contract. On an average, the department has been running around 15% engineering on all projects in the improvement and preservation programs. Therefore, when starting an estimate for a project enter 15 percent as a beginning point for construction engineering and adjust it up or down, using the following table, before final PS&E submittal.

The Region Program Development/Management staff, based on appropriate justification, can approve any changes in the construction engineering percentages for a project different from the rates listed.

Copies of the approved justification letter shall be submitted with the final PS&E turn in for advertisement.

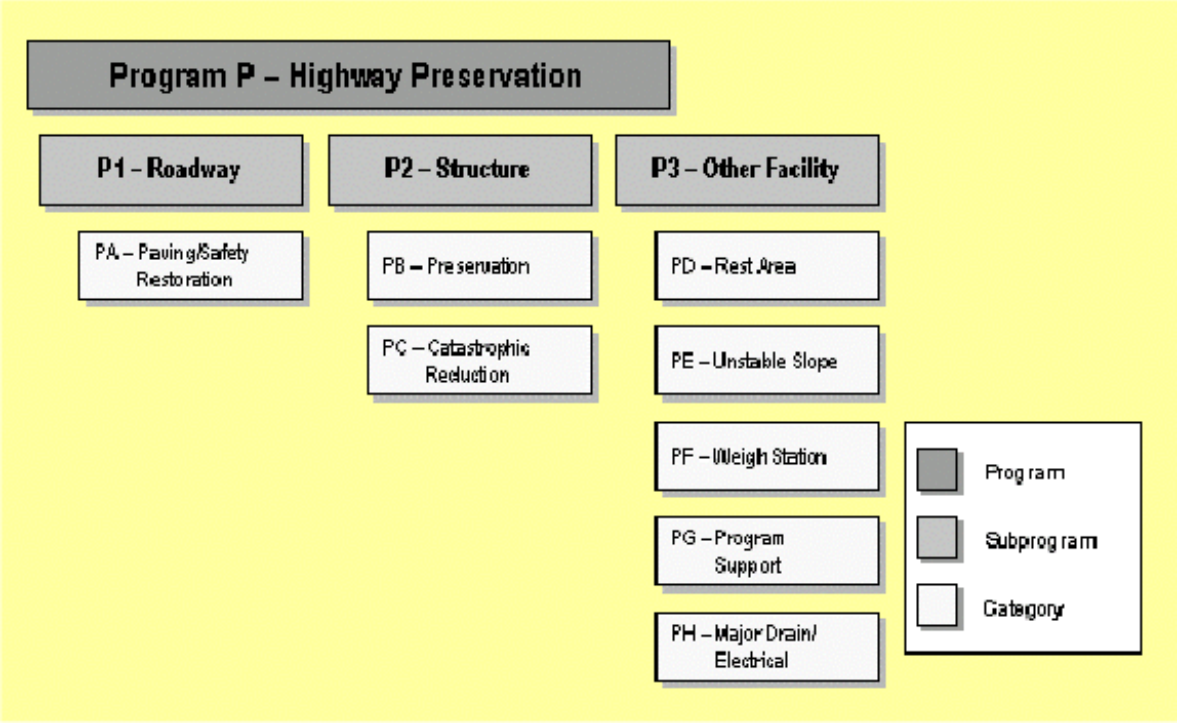
To use the following tables, once the Program and sub-programs have been identified, enter the table with the appropriate dollar amount of the Construction cost only. Construction costs include any below the line items that have Engineering and contingencies applied to them such as utility agreements and work by state forces other than WSDOT. Record that percentage in your estimate. When a project has multiply, programmed sources (example: P1 paver with some I2 safety collision reduction work) break out the construction costs associated with each program and use a weighted average.

Example: $**3,750,000** Total Construction project costs with;

$2,225,000 under Preservation P1 paving (PA)and
$1,525,000 under Improvement I2 collusion reduction (ID)

From Tables
P1-PA = 12%, I2-ID = 18%

$$\frac{(2225000)(.12) + (1525000)(.18)}{3750000} = 14\%$$



PRESERVATION PROJECTS*

			P1	P2		P3				
			PA	PB	PC	PD	PE	PF	PG	PH
$0	-	$250,000	20%	20%	24%	18%	18%	23%	14%	21%
$250,000	-	$500,000	18%	18%	24%	16%	16%	20%	12%	18%
$500,000	-	$1,000,000	16%	16%	22%	16%	12%	18%	10%	16%
$1,000,000	-	$2,000,000	14%	14%	20%	14%	10%	16%	10%	16%
$2,000,000	-	$5,000,000	12%	12%	20%	14%	8%	14%	8%	14%
$5,000,000	-	$10,000,000	10%	10%	18%	14%	6%	14%	8%	14%
$10,000,000	-	+	8%	8%	18%	14%	6%	14%	8%	14%

Highlighted percentages indicate that there were not enough projects for an accurate sample

P Preservation Program

— Preserve the highway infrastructure cost effectively to protect the public investment.

P1 Roadway

Paving projects **(PA)**

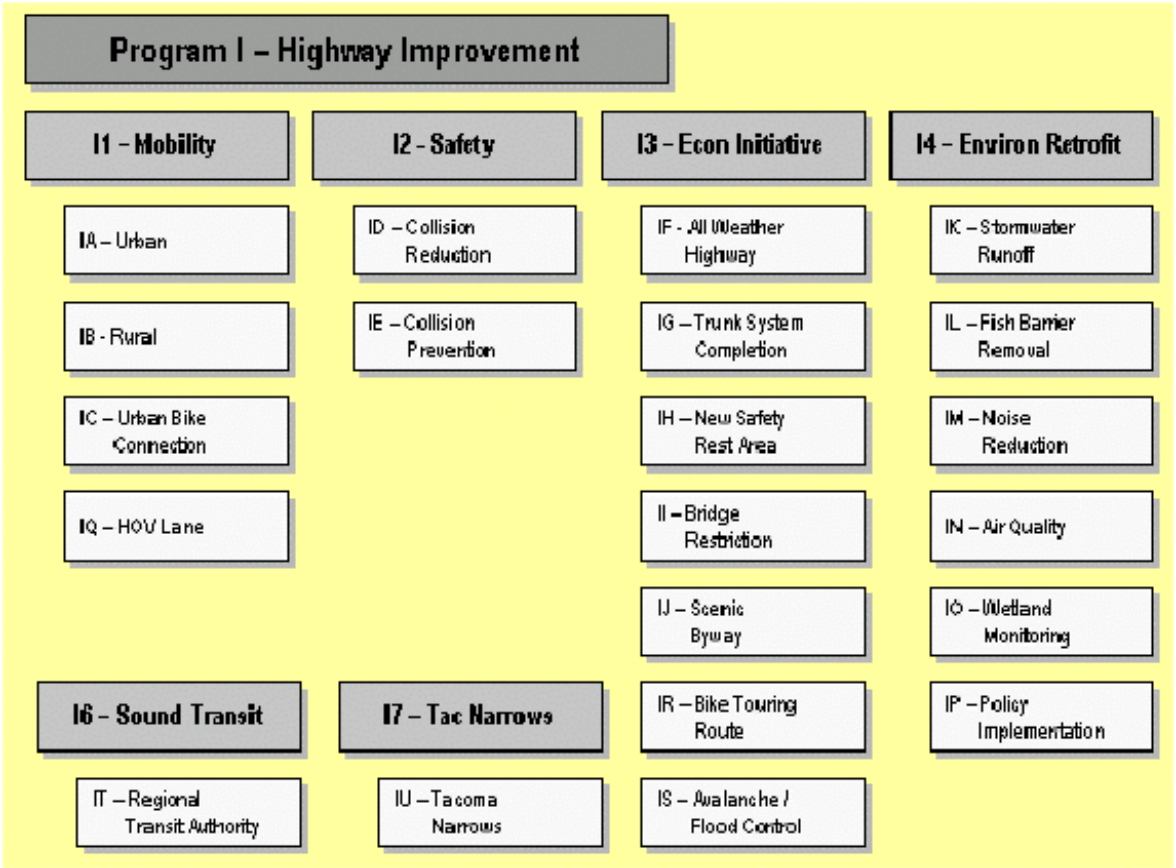
P2 Structures

New construction, updating existing structures projects **(PB)**
Seismic retrofits **(PC)**

P3 Other Facilities

Refurbish existing rest areas to extend service life and improve safety **(PD)**
Construct weigh facilities **(PF)**

Major Refurbishments of electrical systems, electronics, mechanical systems and major Drainage rehabilitation or replacement projects **(PH)**
Slope stabilization Projects **(PE)**
All other items; RA discretionary funds **(PG)**



IMPROVEMENT PROJECTS*

			I1				I2		I3				I4	
			IA	IB	IC	IQ	ID	IE	IF	IG	IH	II	IK	IL
$0	-	$250,000	26%	18%	22%	22%	24%	22%	22%	20%	12%	12%	18%	22%
$250,000	-	$500,000	23%	17%	22%	20%	22%	20%	20%	20%	12%	12%	18%	22%
$500,000	-	$1,000,000	20%	16%	20%	20%	20%	18%	20%	18%	12%	12%	18%	22%
$1,000,000	-	$2,000,000	17%	15%	20%	18%	18%	16%	18%	16%	12%	12%	18%	22%
$2,000,000	-	$5,000,000	14%	14%	18%	16%	15%	14%	16%	14%	12%	12%	18%	22%
$5,000,000	-	$10,000,000	12%	13%	16%	14%	13%	12%	14%	12%	12%	12%	18%	22%
$10,000,000	-	+	10%	10%	14%	12%	10%	10%	14%	10%	12%	12%	18%	22%

Highlighted percentages indicate that there were not enough projects for an accurate sample

I Improvement Program

I1 Mobility — Improve mobility within congested highway corridors**.**

- Congestion Relief Projects Urban **(IA)**
- Congestion Relief Projects Rural **(IB)**
- Bicycle projects **(IC)**
- High Occupancy Vehicle projects **(IQ)**

I2 Safety — Provide the safest possible highways within available resources.

- Accident reduction projects **(ID)**
- Projects that improve roadway geometerics, eliminate at-grade intersections, install signals / channelization at intersections **(IE)**

I3 Economic Initiatives — Support efficient and reliable freight movement on state highways**.** Support tourism development and other Washington industries.

- Freight and Goods improvement to all weather surfaces **(IF)**
- Projects providing four-lane limited access facilities on a trunk system **(IG)**
- Constructing Rest areas **(IH)**
- Replacing or modifying structures on the Interstate System with, restricted vertical clearances and limited overload capacities **(II)**
- Scenic Byway Projects **(IJ)**
- Bicycle rural road shoulder widening projects **(IR)**

I4 Environmental Retrofit — Retrofit state highway facilities as appropriate to reduce existing environmental impacts.

- Reconstruct storm water discharge facilities **(IK)**
- Projects removing fish passage barriers **(IL)**
- Projects including Noise walls, berms, and noise mitigation measures. **(IM)**
- Projects for air quality **(IN)**